4 - Service Tools

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Service Tools

List of service tools

The table below gives a short overview of service tools that can be used for testing, error analysis and repair of product RM-94, refer to various set-ups.

Type Designator	Description
Programme Specific Tools	
MJ-22	Module jig
SF-17	POS flash adapter
DA-16	Docking station adapter
SA-25	RF coupler
SA-86	BT adapter
RJ-66	PWB soldering rework jig
ST-11	uPA solder paste stencil
RJ-46	Antenna switch rework jig
ST-15	Antenna switch solder paste stencil (BOM2)
ST-31	Antenna switch solder paste stencil (BOM1)
Common Service Tools	
RJ-21	uPA rework jig
JBV-1	Docking station
FLS-4S	POS flash dongle E&A
FLS-4S	POS flash dongle APAC
FLS-4S	POS flash dongle US
FPS-8	Flash box
XCS-1	Service cable
XCS-4	Service cable
PCS-1	Power supply cable
CA-41	Power supply cable
CA-5S	Service battery cable
DAU-9S	Service cable

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Type Designator	Description
XRF-1	RF-meas cable/DCS1900
FPS-11	Multiprommer
ACF-8	Universal power supply
AXS-4	D9-D9 serial cable
FLC-2	DC cable
CA-10DS	Bi-directional parallel cable
PKD-1	Software protection key
SCB-3	DC-cable
SPS-2	Solder paste spreader
DAU-9T	Service cable (for testing phone with Xpress-on funshell)
Programme Specific Service Tool spare parts	
	10pcs 2A fuse for MJ-22 module jig
	10pcs Test pins for MJ-22 module jig
	10pcs Test pins for MJ-22 module jig
	1pc wing screw M3x20 for MJ-22 module jig
	10pcs pest pins for SF-17 POS flash adaptor
	10pcs flash interface pins for DA-16 docking station adaptor
	10pcs SIM interface pins for DA-16 docking station adaptor

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JVB-1 Docking Station with DA-16 Docking Station Adapter

The JVB-1 docking station has been designed for calibration and software update use. The DA-16 docking station adapter makes signal connections to the phone. JVB-1 and DA-16 are used as one unit.

JVB-1 main electrical functions include the following:

- adjustable VBATT calibration voltage, current measurement limit voltage “VCHAR”, current measurement calibration “ICHAR”
- adjustable ADC calibration voltage via BTEMP and BSI signal
- BTEMP and BSI calibration resistor
- signals from FBUS to the phone via parallel jig
- control via FBUS or USB
- Flash OK/FAIL indication

In calibration mode JVB-1 is powered by external power supply 11-16V DC. In flashing power for the phone can be taken from FPS-8 or external power supply 11-16V DC.

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DA-16 Docking Station Adapter

Docking station adapter for assembled RM-94 phones. The docking station adapter supports testing, flashing, energy management calibration. If used in conjunction with the RF-coupler SA-25, also RF function testing is possible.

Features include:

- compatible for JBV-1
- easy phone attachment and detachment
- reliable phone locking
- switch for reliable detection of phone attachment
- replaceable test pins
- internal SIM holder with interface to phone SIM reader

Spare parts:

- Flash interface pins (10pcs)
- SIM interface pins (10pcs)

View of DA-16

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SA-25 Antenna Coupler

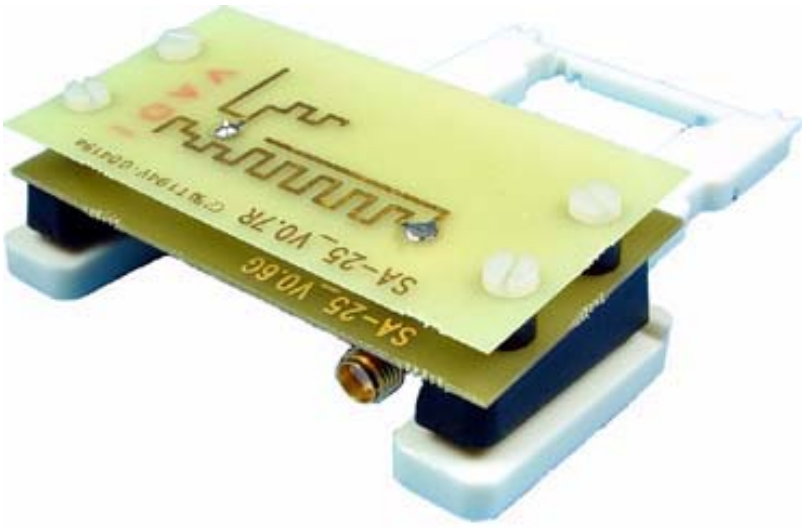
RF antenna coupler for use with the docking station adapter (DA-16).

Extends the docking station adapter to allow RF function tests in GSM bands 850, 900, 1800 and 1900 MHz.

Features include:

- easy attachment to DA-16 without use of tools
- reliable RF connection to phone module under test
- low attenuation and small “ripple” over the width of each GSM band

View of SA-25



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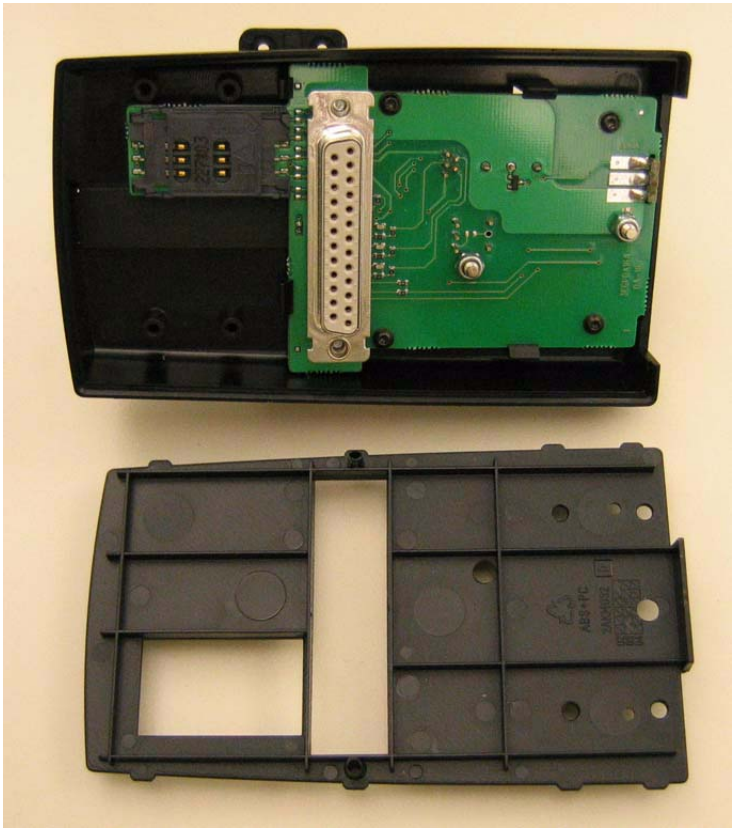
Installing instructions for RF coupler to docking station adapter

Open the housing by pressing the housing apart. Now you can remove the bottom plate of the docking station adapter.



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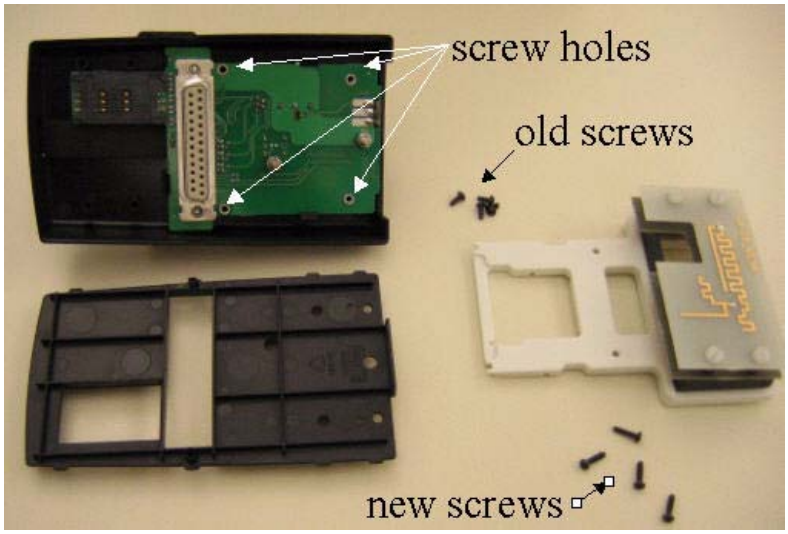
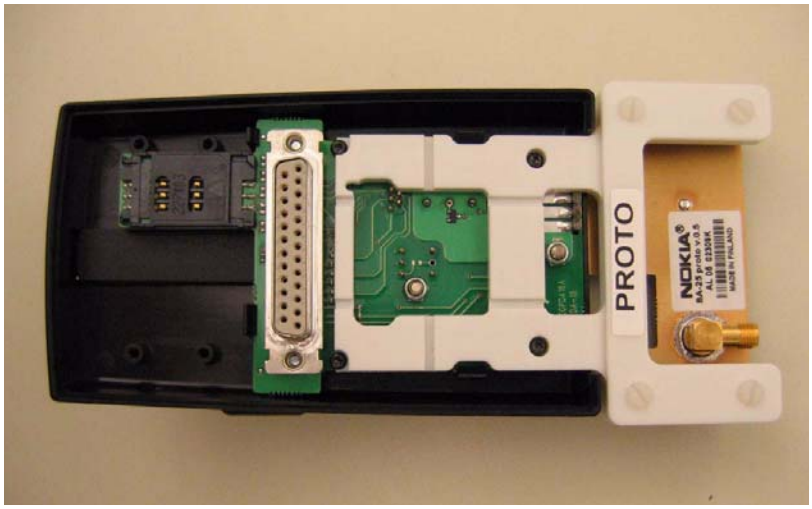
Remove the four screws fixing the PWB by using Torx T6 screw driver. These screws are too short, therefore four longer screws are delivered together with the coupler.



Install the coupler and use the new screws.



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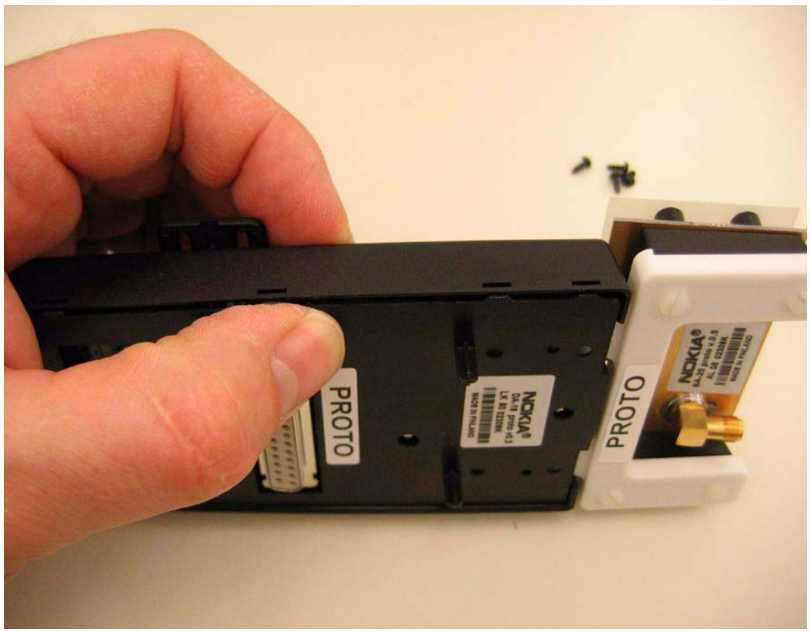
Close the docking station adapter by attaching the bottom plate.



Ready.

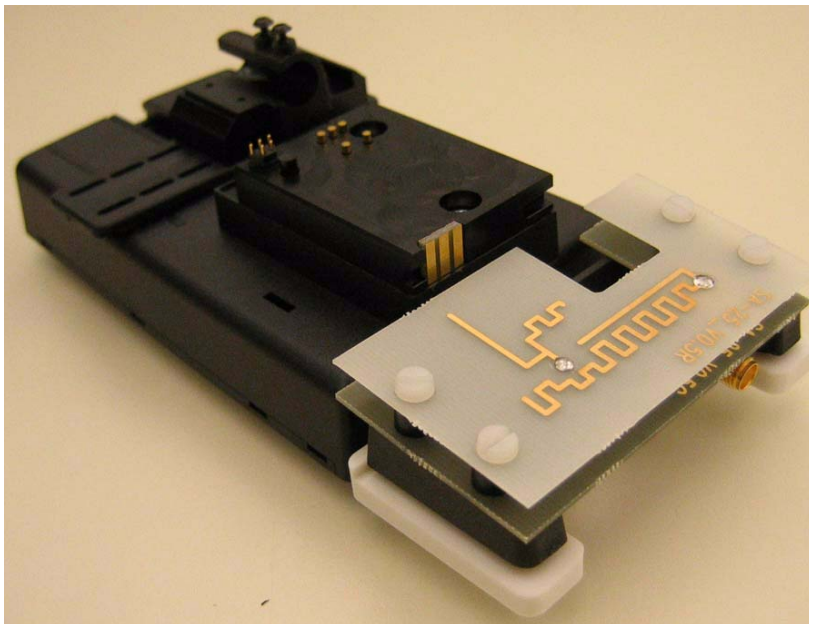


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Table 1: Attenuation table for antenna coupler SA-25 V0.7

Docking station antenna coupler SA-25_V0.7 attenuation table for 6020, measured with Universal Radio Communication Tester CMU-200.

System	Channel	Tx-att. (dB)	Rx-att. (dB)
EGSM 900	975	4.9	5
	38	5.3	6
	124	5.9	7
GSM 1800	512	4.9	5
	698	4.7	5
	885	4.5	5
GSM 1900	512	4.8	6
	700	4.9	6
	810	4.9	6

Tx-attenuation tolerance is +/-0.5 dB.

Rx-attenuation tolerance is +/-1.0dB.

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SF-17 CCS POS Flash Adapter

Point of sales flash adapter for RM-94 phones.

SF-17 establishes a simple environment for SW update purposes and connects to the same flash test pattern and the phone battery contacts.

Features include:

- flashing and testing of the attached phone
- overvoltage and reverse polarity protection of adapter and attached phone
- green LED: power supply valid and attached to the phone (3.5V<Vcc<7V)
- red LED: overvoltage condition, phone power supply disconnected (Vcc>7V)
- shielded 10-pin Western connector towards flash equipment or PC
- 3mm DC-jack for phone and adapter power supply
- phone battery contacts (VCC, GND, BSI)
- flash test pattern pins

View of SF-17

Spare Parts

There are no serviceable parts inside SF-17, and SF-17 is not designed for disassembly. Only serviceable part are the spring loaded test pins that can be replaced without soldering and disassembly. Used test pin type is SX-1-J-2.0-G from manufacturer IDI.

Bent pins can be extracted from adapter's receptacle using a tool. Torn off pins can be replaced using a slowly spinning 0.8 mm. For more detail, please refer to the Service Tool Troubleshooting section.

Test pins (10pcs / plastic bag)

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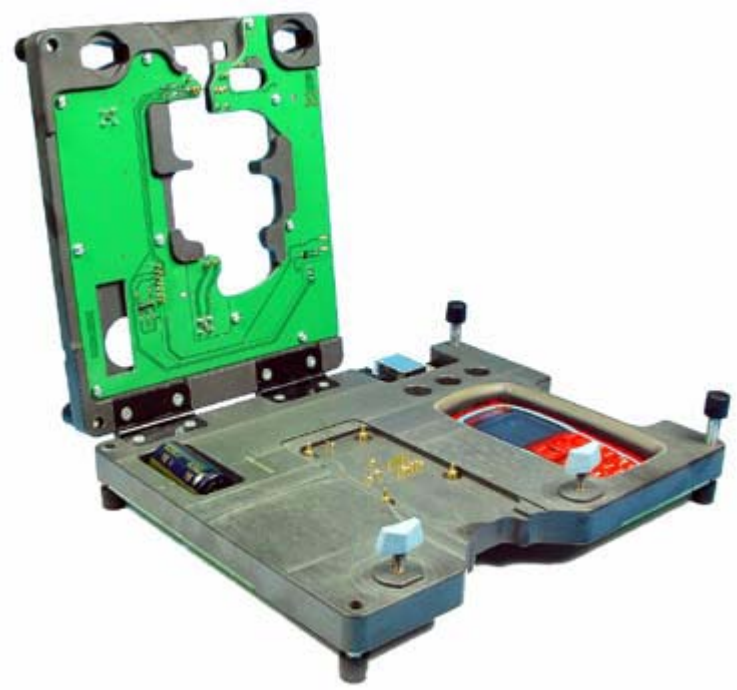
MJ-22 Module Repair Jig

Repair Jig for RM-94 phone module that allows full phone function.

General features include:

- easy phone module insertion and removal, proven jig locking mechanism
- ESD-proof base material and jig design
- unlimited operation of a disassembled phone module
- unrestricted access to phone module components
- access to system connector for accessory testing
- jig SIM holder with interface to phone SIM reader
- the installed UI module on the module jig allows key and display function test
- microphone, ear speaker and integrated handsfree speaker supplied on jig for testing
- LOCAL/NORMAL switch
- access to phone module POWER-ON push-button
- quick and easy repair of jig components

View of MJ-22



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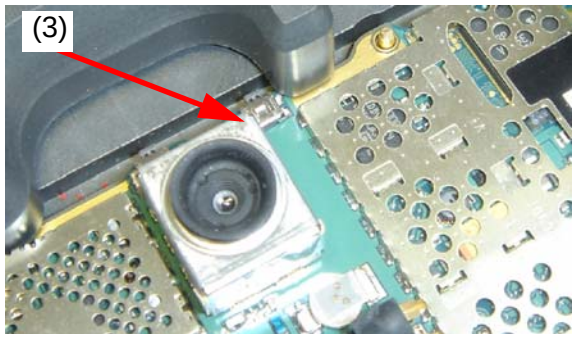
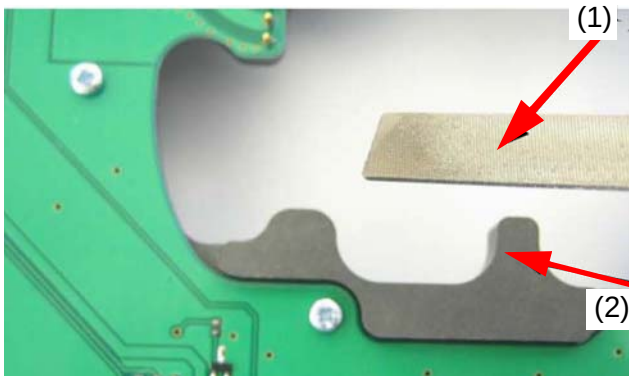
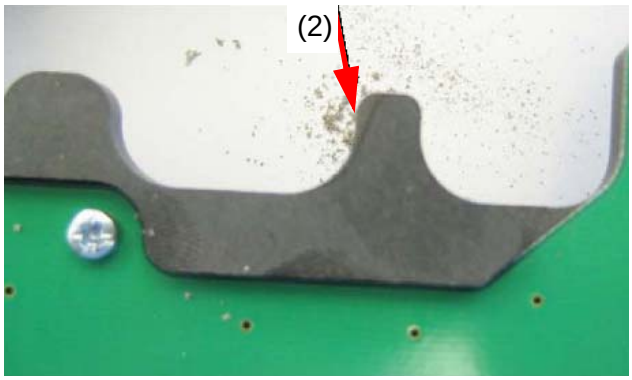
Module repair jig MJ-22 update

The module repair jig MJ-22 needs to be updated because the holder can touch the soldering point of the switch and cause mechanical stress (3).



Remove a small part of the press pad (2) with a simple file (1).





Power supply features

- jig and phone power supply via 3mm DC jack, fuse
- power stabilization and voltage regulator on jig (can be bypassed by jumper)
- reverse and over-voltage protection of jig and phone module

Communication and status LED's

- green: Power supply
- green: MBUS activity
- orange: FBUS activity
- jumper to disable LED's for precise phone module current consumption measurements

Spare parts

- spring loaded test pins (used in upper part, can be replaced by soldering)

  Test pins (10pcs / plastic bag)

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- both ends spring loaded test pin (used in lower part, can be replaced by hand after disassembly of lower PCB)

  Test pins (10pcs / plastic bag)

- fuse inside holder

  Fuses (10 pcs)

- wing screw M3x20

  Replacement part (1pc)

Usage hints

- **Before first use,** verify setting of power supply jumper on the rear (=bottom PCB) of the jig; if power supply is >4.2 V, make sure jumper enables power regulation of the jig in order to prevent overvoltage for the phone module under test and the jig.
- In case of **flashing problems** in the jig, verify the switch on the upper part of the jig is in position “Flash”; position “Accessory” is intended for ACI tests with connected ACI-communication enabled accessories, such as car kits or camera headsets.
- FM ANT (X7) is not applicable for RM-94.
- On left hand side there is a slit for IrDa.
- When shielding lids are removed from the shielding frame on the PWB, new shielding lids must be used for proper closing of the shielding. It is not allowed to re-use the removed ones.

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RJ-66 Soldering Jig

Soldering jig is used for module level repair, either as fixation in µBGA rework places or when there is need to hold a module on the work bench for any other repair. The soldering jig is also usable for RH-37, RH-49, RM-17, RM-30 and RM-31.

Features include:

- convenient locking mechanism
- four (optional mount) rubber feet allow usage also on repair benches
- fixation of phone module in both ways possible (bottom or top side up)
- ESD proof material
- standard uBGA jig thickness and outer dimensions

View of RJ-66

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ST-11 PA Rework Stencil

The PA rework stencil is reused from RH-23.

RJ-21 PA Rework Jig
(The PA rework jig is designed for RH-23, RM-30 and RM-31)

If spreader is needed, please refer to

SPS-2 Spreader

Note: For RM-94, another stencil than the one included in the rework kit SK-9 is needed, because another PWB pad layout is used. Therefore, ensure that for RM-94 the stencil ST-11 is used for PA repairs.

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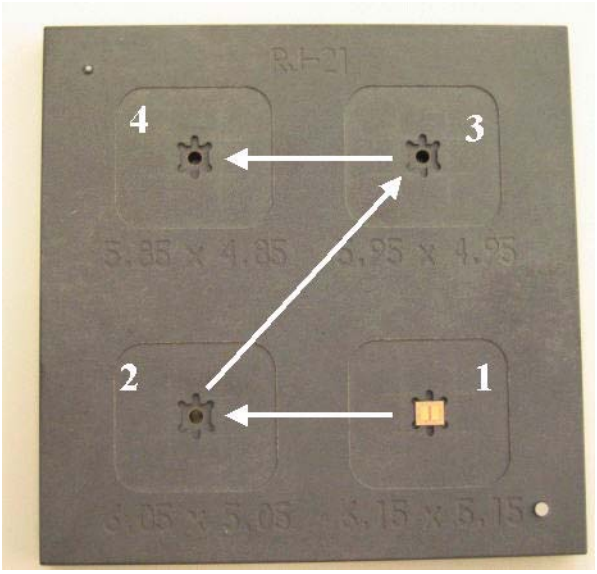
Rework procedure

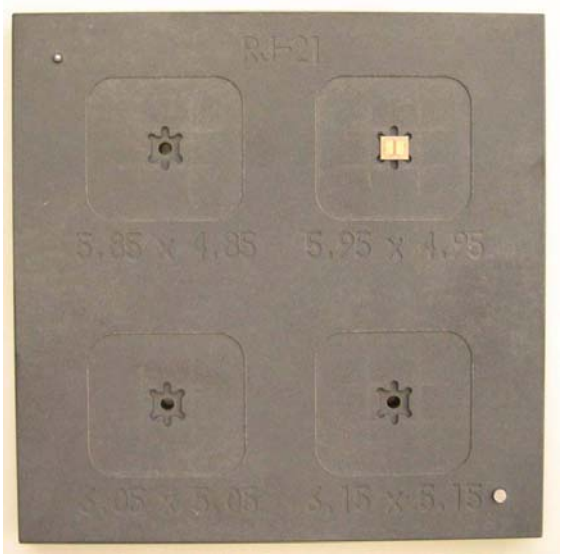
Due to the large mechanical tolerance of the power amplifiers, the following procedure is necessary:

1. Put the power amplifier into the RJ-21 rework jig. The PA should be placed in the best fit location, this is determined by placing it in the largest location first, if this is to large reposition the PA in the next size location. This should be carried out until the best fit location is found.



1. Once the best fit location has been found, leave the PA there and put the stencil on top of the jig and PA.

Table 2:



2. Put soldering paste on the PA properly.

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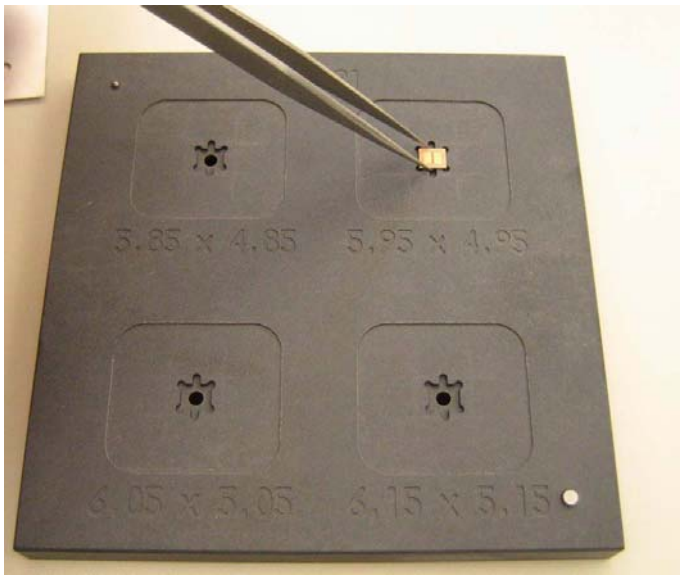
3. Remove the stencil and the PA from the jig.



4. Start the soldering process.

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RJ-46 Antenna Switch Rework Jig

View of RJ-46

ST-15 / ST-31 Antenna Switch Solder Paste Stencil

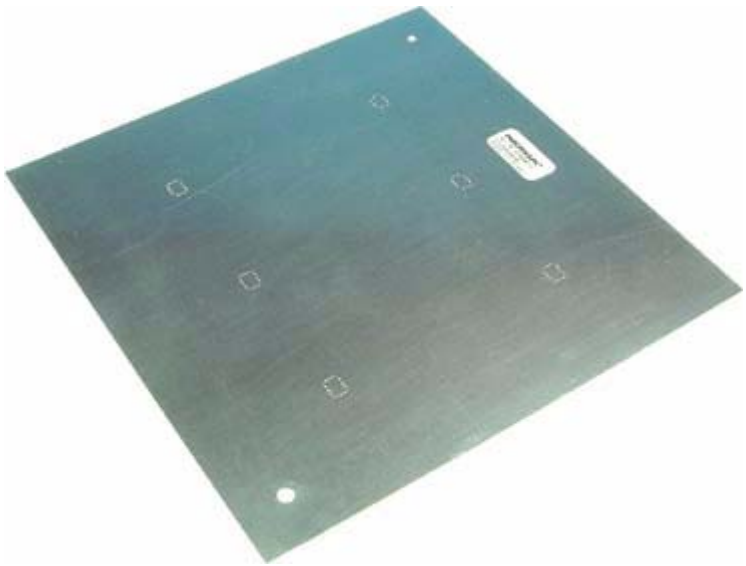
- ST-15 Antenna Switch Solder Paste Stencil

  Note: ST-15 is only usable for BOM2 and for ASM from Murata.

- ST-31 Antenna Switch Solder Paste Stencil

  Note: ST-31 is only usable for BOM1 and for ASM from Hitachi.

View of ST-15 and ST-31



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FPS-8 Flash Prommer

The flash prommer FPS-8 is used with e.g. docking station (+adapter) or the POS flash adapter. Power is supplied to FPS-8 from the universal power supply.

The sales pack includes the following hardware items:

- FPS-8 Flash Prommer
- ACF-8 Universal Power Supply
- AXS-4 Service Cable (D9-D9)
- CA-10DS Bi-directional Parallel Cable

View of FPS-8

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FPS-10 Flash Prommer

FPS-10 interfaces with:

- PC
- Control unit
- Flash adapter
- Smart card

FPS-10 flash prommer features:

- Flash functionality for BB5 terminals
- Smart Card reader for SX-2 or SX-4
- USB traffic forwarding
- USB to FBUS/Flashbus conversion
- LAN to FBUS/Flashbus and USB conversion
- Vusb output switchable by PC command

FPS-10 sales package includes:

- FPS-10 prommer
- Power Supply with 5 country specific cords
- USB cable

View of FPS-10

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FPS-11 Multiprommer

View of FPS-11

ACF-8 Universal Power Supply

ACF-8 universal power supply is used to power FPS-8. ACF-8 has 6 V DC and 2.1 A output.

View of ACF-8

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FLC-2 DC Cable

The FLC-2 is used to supply a controlled operating voltage.

View of FLC-2

AXS-4 Service Cable

The AXS-4 D9-D9 service cable is used to connect two 9 pin D connectors e.g. between PC and FPS-8. Cable length is 2 meters.

View of AXS-4

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XCS-1 Service Cable

The XCS-1 service cable is used to connect FLS-4 to SF-17.

View of XCS-1

SW Security Device PKD-1

SW security device is a piece of hardware enabling the use of the service software when connected to the parallel (LPT) port of the PC. Without the dongle present it is not possible to use the service software. Printer or any such device can be connected to the PC through the dongle if needed.

Caution: Make sure that you have switched off the PC and the printer before making connections!

Caution: Do not connected the PKD-1 to the serial port. You may dam age your PKD-1!

View of SW Security Device

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FLS-4S POS (Point Of Sale) Flash Device (Sales Pack)

FLS-4S is a dongle and flash device incorporated into one package, developed specifically for POS use.

View of FLS-4S

PCS-1 Power Cable

The PCS-1 power cable (DC) is used to connect e.g. JVB-1 to FPS-8.

View of PCS-1

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CA-41 PS

Power supply cable (for FPS-10 flash concept only).

View of CA-41

XRF-1 RF Cable

RF cable XRF-1 is used to connect e.g. module jig to RF measurement equipment.

View of XRF-1

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DAU-9S MBUS Cable

The MBUS cable DAU-9S has a modular connector, and is used with between PC's serial port and e.g. module jig.

View of DAU-9S

XCS-4 Modular Cable

XCS-4 is a shielded cable (one specially shielded conductor) modular cable for flashing and service purposes.

View of XCS-4

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CA-5S Service Battery Cable

Charger plug to charger plug service cable.

View of CA-5S

CA-10DS Bi-directional Parallel Cable

Bi-Directional parallel cable included in FPS-8 sales pack.

View of CA-10DS

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DAU-9T Service Cable

Pop-Port™ to D9 connector service cable, used for testing correct operation of phone and XPress-on Funshell.

View of DAU-9T

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